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ABSTRACT

This learning module provides students with practice in applying mathematical operations to vocational agriculture. The module consists of unit objectives, definitions, information, problems to solve, worksheets suitable for various levels of vocational agriculture instruction, and answer keys for the problems and worksheets. This module, which covers decimals, provides practice in activities such as converting fractions to decimals and converting decimals to fractions; and addition, subtraction, multiplication, and division of decimals. These concepts are shown through applications such as determining housing needs for various kinds of farm animals, and estimating cost of materials for a job. (KC)

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TEACHING UNIT: **DECIMALS**

TRAINING ACTIVITIES : Converting fractions to decimals

Converting decimals to fractions

Addition and subtraction of decimals

Multiplication and division of decimals

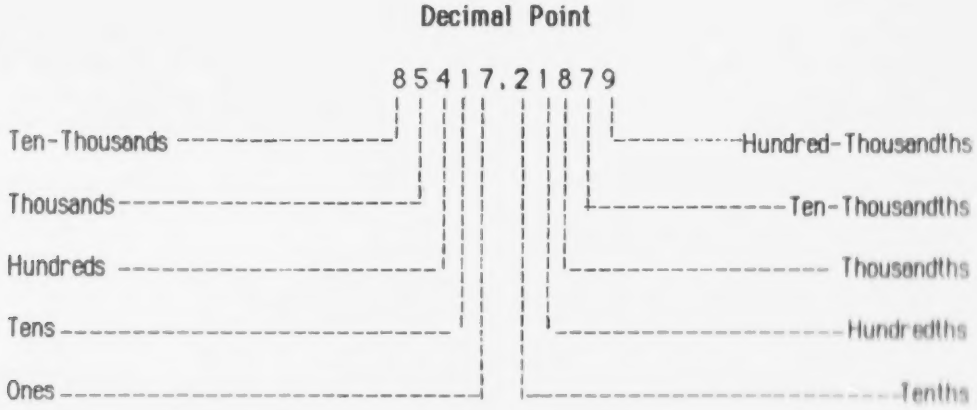
UNIT OBJECTIVES :

(1) To provide experiences which will enable students to become efficient in the basic computational skills involving decimals.

(2) To present arithmetic concepts of working with decimals in a manner keeping with the interests of vocational agriculture students.

THE DECIMAL SYSTEM

The decimal system is a means of expressing numbers which are parts of whole numbers. The place-value of the decimal number system is expanded by placing the whole numbers on the left separated from partical numbers on the right by a decimal point. The expanded place-value is as follows:



The word "and" is used in numeration of the decimal system to indicate the separating point (decimal point) between the whole part of the number and the decimal partical part.

Example: 47, 2195 is written as:

Forty-seven and two thousand one hundred ninety-five ten-thousandths.

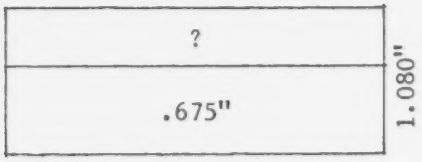
NAME _____

Addition and Subtraction of Decimals

Instructions: Solve the following problems.

1. The odometer readings on three farm trucks are 8,217.6, 432.8 and 89,531. According to the odometers, what is the total miles the trucks were driven?

2. Mrs. Jones bought two packages of meat. One package weighed .6 pound. The other weighed .75 pound. What is the combined weight of these two packages?



3. Two pieces of wood were glued together. Their combined thickness is 1.080 inches. One piece of wood was .675 inch thick. How thick is the other piece?
4. John wants to purchase a package of seeds that costs $1.49. He now has $.75. How much more money does he need in order to buy the seeds?

5. Three sheets of metal are to be placed on top of each other. Their thickness are .135 inch, .016 inch, and .070 inch. What would be the combined thickness of all three pieces?

6. Farmer Jones recorded his tractor's hour meter reading as 4,871 .3 as he started mowing hay. When he finished the job, the reading was 4,882.4. How many hours of engine operating time was spent mowing?

7. A hydraulic hose on a combine has an outside diameter of 1.62 inches. If the wall thickness is .125 inch (.250 inch for both walls), what is the inside diameter of the hose?

8. If a 220 pound market hog yields a 147.4 pound carcass, what is the loss of weight from dressing?

NAME _____

Multiplication and Division of Decimals

INSTRUCTIONS: Solve the following problems.

1. If 7.5 gallons of disel fuel requires one cubic foot of space, what is the volume in cubic feet of a fuel storage tank designed to hold 2,500 gallons of fuel?

2. A show steer weighs 781 pounds. If the steer averages gaining 2.875 pounds per day, how many days will it take to get the steer's weight up to 850 pounds?

3. A farmer has a tractor that consumes an average of 4.62 gallons of fuel per hour while plowing. If he can average plowing 3.45 acres per hour, how many gallons of fuel will be required to plow a 51.75 acre field?

4. A sheet of plywood is 48 inches wide and 96 inches long. The plywood is to be ripped into halves using a table saw that has a blade on it that is .125 inch wide. What will be the width of each piece of plywood after the cut is made?

HOURS WORKED
Monday----------3.75 Tuesday---------6.30 Wednesday-------5.45

5. Billy works at his uncle's dairy farm for his SOE program. If his uncle pays him $3.80 per hour and Billy worked 3.75 hours Monday; 6.3 hours Tuesday; and 5.45 hours Wednesday, how much money would his uncle owe him for the three days?

NAME _____

WORKSHEET

COURSE: **Agricultural Production II**

COMPETENCY: #006 – "Determine the housing needs for various kinds of farm animals"

INSTRUCTIONS: Complete the following problems.

		Fresh Feces and Urine Per Animal Except for Broilers & Turkeys				
		Lbs/Animal/Day				
	Average Animal Weight (lbs.)	Manure	Nitrogen (N)*	Phosphorus (P)	Potassium (K)	COD
Dairy	1400	105	0.63	0.15	0.57	11.3
Beef	1000	64.	0.36	0.10	0.25	8.20
Swine	100	8.4	0.048	0.014	0.021	0.71
Caged Layer	4	0.27	0.0038	0.0012	0.0013	0.053
Broiler, dry litter**	2	0.05	0.0015	0.00052	0.0008	–
Turkey, dry litter***	15	0.15	0.0026	0.001	0.0009	–

* Generally about 50% of nitrogen in fresh waste is volatilized and not available for fertilization, so only about half the listed number should be used for agronomic calculations.

** Manure plus litter at 25% moisture after 5 flocks of birds.

*** Manure plus litter at 30% moisture after full annual production.

1. How many pounds of Nitrogen are in one ton of fresh dairy cattle feces and urine? _____ pounds.

2. A dairy cow will produce how much fresh feces and urine per year? _____ pounds.

3. A 1400 pound dairy animal will produce how many pounds of Nitrogen by fresh feces and urine each year? _____ pounds.

4. How many more pounds of potassium will five 1400 pound dairy cows produce in a year than ten 1000 pound beef animals? _____ pounds.

5. If nitrogen in commercial fertilizer is valued at $.04 per pound, what would be the value of nitrogen produced by a 1400 pound dairy cow through fresh feces and urine: (a) per day; (b) per 30 day period; and (c) for one year? (Assume one year equals 365 days)
(a) $ _____ (b) $ _____ (c) $ _____

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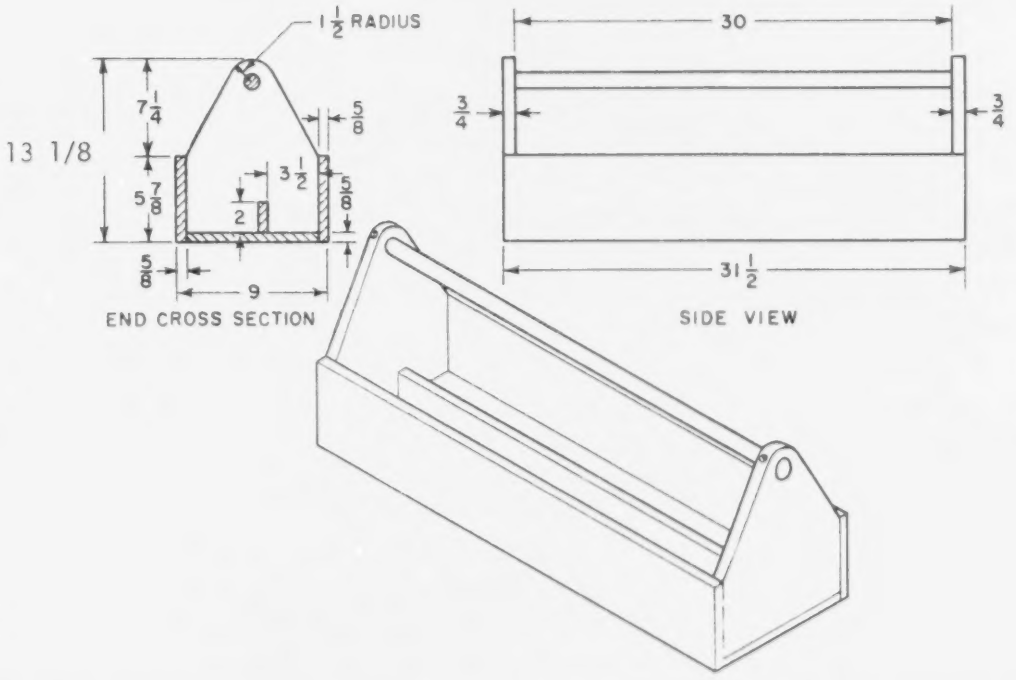
Name _____

WORKSHEET

COURSE: **Agricultural Production III**

COMPETENCY: # 014 - "Estimate and compare cost of materials needed for a specific job"

INSTRUCTIONS: Complete the folowing problems. Round answers to nearest hundredth unit.



1. From the plan above, determine the size of the following: (thickness x width x length)
   a. bottom _____" x _____" x _____". b. ends _____" x _____" x _____".
   c. sides _____" x _____" x _____". d. partition _____" x _____" x _____".

2. Determine the diffence in cost of constructing the tool box with pine or oak lumber, assuming that 3.08 board feet of lumber are required for the project. Pine lumber costs $300 per thousand board feet and oak lumber costs $500 per thousand board feet. $ _____.

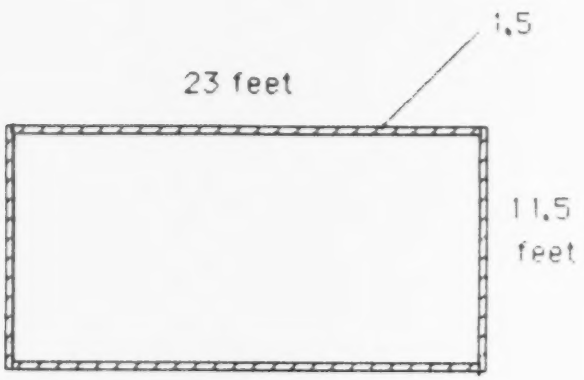
Name _____

WORKSHEET

COURSE: **Agricultural Production II**

COMPETENCY: **# 019 - "Lay out forms for pouring concrete for a given job"**

INSTRUCTIONS: Complete the following problems.



1. Tonya is planning to build a metal storage building which is to be 11.5 feet wide and 23 feet long. She plans to pour a concrete floor for the building and has purchased 6 pieces of 2" x 4" x 12' wood from which she plans to make her concrete forms. Will the lumber purchased be enough for the job? (***NOTE***: Write "YES" or "NO" in the blank below.)

   _____.

2. How much will Tonya need to cut off the pieces of lumber used for the ends to build the forms illustrated above? _____ inches.

3. Assuming that Tonya cuts all the excess length off of only one of the pieces of wood used to form a side, how much will she need to cut off, assuming that the lumber is actually 1.5" thick? _____ inches.

ANSWER KEY FOR MODULE TITLED "DECIMALS"

Module Training Unit (Addition and Substraction):

(1.) 98181.4 (2.) 1.35 pounds (3.) .405 inches (4.) $ 0.74
(5.) .221 inches (6.) 11.1 (7.) 1.37 inches (8.) 72.6 pounds

Module Training Unit (Multiplication and Division):

(1.) 333.33 (2.) 24 (3.) 69.3 (4.) 23.9375 inches (5.) $ 58.90

Competency #006 Worksheet:

(1.) 12 (2.) 38,325 (3.) 229.95 (4.) 127.75
(5a.) $0.0252 (5b.) $0.756 (5c.) $9.198

Competency #014 Worksheet:

(1a.) 5/8" x 9" x 31 1/2" (1b.) 3/4" x 7 3/4" x 13 1/8"
(1c.) 5/8" x 5 7/8" x 31 1/2" (1d.) 5/8" x 2" x 30"
(2.) $0.90

Competency #019 Worksheet:

(1.) YES (2.) 6 (3.) 12